The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JAMES M. OLSON

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Appeal No. 2000-0049
Application 08/826,209

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ON BRIEF

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Before OWENS, LIBERMAN and JEFFREY SMITH, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1-3, 5-10, 12, 18 and 19, which are all of the claims remaining in the application.

THE INVENTION

The appellant's claimed invention is directed toward methods for making a wear part coated with a diamond film

having a {100} crystallographic faceting layer and a non-{100} crystallographic faceting layer. Claims 1 and 7 are illustrative:

1. A method for making a diamond film coated wear part, comprising the steps of:

providing a wear part;

depositing a first layer of polycrystalline diamond film on said part with non-{100} crystallographic faceting;

depositing on the surface of said first layer a second layer of polycrystalline diamond film having {100} crystallographic faceting, said second layer having a thickness sufficient to overgrow the roughness of said surface of said first layer with a continuous film.

7. A method of making a wear component, comprising the steps of:

providing a base surface;

producing a polycrystalline diamond film structure having a first layer and a second layer on said first layer, said first layer having non-{100} crystallographic faceting, and said second layer having {100} crystallographic faceting, said second layer having a thickness sufficient to overgrow the roughness of said surface of said first layer with a continuous film; and

applying said diamond film to said base surface.

THE REFERENCES

Taniguchi et al. (Taniguchi) 5,380,349 Jan. 10,

1995

Okamura[1] 5-23903 Feb. 2, 1993
(Japanese patent publication)

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1, 2, 5-9, 12, 18 and 19 over Okamura in view of Taniguchi, and claims 3 and 10 over Okamura in view of Taniguchi and the admitted prior art.

OPINION

We reverse the aforementioned rejections and remand the application to the examiner.

Okamura discloses a diamond-coated cutter which "consists of a substrate and a double diamond coat layer constituted by a first diamond layer mainly composed of (100) crystal plane formed via a wax material on the surface of the above-mentioned substrate and a second diamond layer mainly composed of (111) crystal plane coated on the above-mentioned first diamond layer" (page 5).

[1] Citations herein to Okamura are to an English translation thereof, a copy of which is provided to the appellant with this decision.

Taniguchi discloses a mold for press molding a glass-containing optical element, wherein at least the molding face of the mold matrix is coated with a diamond film having a (100) oriented face which is flattened by polishing or etching such that has a low surface roughness (col. 4, lines 4-9 and 53-56). The disclosure by Taniguchi relied upon by the examiner (answer, page 4) is that "[i]t is well known in the art that the (100) face of diamond is the softest of the (100), (111) and (110) faces" (col. 4, lines 51-53).

The examiner argues that "when it is desired to sacrifice the high peeling resistance and long life of the cutting tool in order to obtain a smooth outer surface of the cutting tool as suggested by Taniguchi et al. it would have been obvious to one of ordinary skill in the art to have switched the order of the first and second diamond layer in Okamura et al.'s process with the expected success" (answer, page 4).[2]

In order for a *prima facie* case of obviousness to be established, the teachings from the prior art itself must appear to have suggested the claimed subject matter to one of

[2] The examiner does not discuss the embodiment recited in the appellant's claim 7.

ordinary skill in the art. *See In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976). The mere fact that the prior art could be modified as proposed by the examiner is not sufficient to establish a *prima facie* case of obviousness. *See In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). The examiner must explain why the prior art would have suggested to one of ordinary skill in the art the desirability of the modification. *See Fritch*, 972 F.2d at 1266, 23 USPQ2d at 1783-84.

The examiner has not explained how Taniguchi's disclosure of a smooth mold surface for molding glass optical elements would have led one of ordinary skill in the art to modify the wear characteristics of a cutting tool, particularly when that modification involves reversing the order of Okamura's layers and Okamura teaches (page 4) that the first layer is be a (100) oriented layer because, although it has low hardness, it has high adhesion which is a desirable first layer property, and the second layer is to be a (111) oriented layer because, although it has low adhesion, it has excellent wear resistance which is a desirable property of the second layer.

The record indicates that the motivation relied upon by the examiner for combining the references so as to arrive at the claimed invention comes from the description of the appellant's invention in the specification rather than coming from the applied prior art and that, therefore, the examiner used impermissible hindsight when rejecting the claims. *See W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *In re Rothermel*, 276 F.2d 393, 396, 125 USPQ 328, 331 (CCPA 1960).

Accordingly, we reverse the examiner's rejections.[3]

Remand

The appellant's claim 7 requires that a polycrystalline diamond film structure having a layer with a non-{100} crystallographic faceting and a layer with a {100} crystallographic faceting is applied to a base surface. The claim does not specify the order of the layers on the base surface.

Okamura discloses applying a (111) oriented diamond layer and then a (100) oriented diamond layer onto an Si substrate, each layer having a 100 μm thickness, and then brazing the (100) oriented layer onto a wear part, the heat from the brazing causing the (111) oriented layer to peel off of the Si substrate, thereby producing the desired cutting tool (pages 7-8). Thus, Okamura specifically discloses each of the limitations of the appellant's claim 7 except the requirement that the second layer has a thickness sufficient to overgrow the roughness of the surface of the first layer.

[3] The examiner does not rely upon the admitted prior art in the rejection of claims 3 and 10 for a disclosure which remedies the above-discussed deficiency in the examiner's argument with respect to Okamura and Taniguchi.

The appellant's specification discloses (page 5, lines 1-2) that the thickness of the (111) oriented layer depends on nucleation density but in practice may be on the order of 0.5-10 µm. Okamura's 100 µm exemplified (111) oriented layer (page 7) is thicker than thicknesses within the appellant's disclosed first layer thickness range, and the appellant's specification discloses (page 2, line 21 - page 3, line 4) that as the thickness of a (111) oriented layer increases, the roughness generally increases. Okamura's exemplified 100 µm thickness of the (100) oriented layer (page 7), however, is larger than the 10-25 µm range of thicknesses of the (100) oriented layer disclosed in the appellant's specification (page 10, line 24 - page 11, line 3).

Thus, we remand the application to the examiner for the examiner and the appellant to address whether Okamura's 100 µm thick (100) oriented layer necessarily is sufficiently thick to overgrow the surface roughness of Okamura's 100 µm thick (111) oriented layer as required by the appellant's claim 7. If so, the examiner should consider rejecting the appellant's claims 7-9 and 19 under 35 U.S.C. § 102(b) over Okamura, and should consider whether the appellant's claims 10 and 12 would

have been obvious to one of ordinary skill in the art over Okamura in view of the appellant's admitted prior art regarding biased nucleation chemical vapor deposition (specification, page 13, lines 1-7).[4]

DECISION

The rejections under 35 U.S.C. § 103 of claims 1, 2, 5-9, 12, 18 and 19 over Okamura in view of Taniguchi, and claims 3 and 10 over Okamura in view of Taniguchi and the admitted prior art, are reversed. The application is remanded to the examiner.

REVERSED and REMANDED

TERRY J. OWENS)
Administrative Patent Judge)
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[4] The examiner also should consider whether the appellant's claim 7 provides adequate antecedent basis for "said step of depositing said first layer" in claim 19.

	) BOARD OF PATENT
PAUL LIEBERMAN	)
Administrative Patent Judge	) APPEALS AND
	)
	) INTERFERENCES
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JEFFREY T. SMITH	)
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